THE VETERINARY RECORD

A Weekly Journal for the Profession.

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S.

No. 1539 JANUARY 5, 1918. VOL. XXX.

FOLLICULAR MANGE.

One of the several interesting portions of Capt. Armfield's informative paper to the Central V.S. (p. 273 *et seq.*) relates to bovine follicular mange. It appears that follicular mange is "very prevalent" among cattle in North-western Rhodesia, and has recently been reported as prevalent in Nyasaland also. This is the first time it has been reported as being at all common in any country. The disease has been seen in Europe and in America; and Bugge has observed it in two herds of cattle in which over 70 out of 480 animals were affected. Still, its occurrence in cattle has hitherto been regarded as quite exceptional. It is possible that it may be common also in other countries as yet comparatively little explored by veterinary science; and it is certain that, wherever it is prevalent, it constitutes a serious economic danger. Not only does it damage or destroy the hides; but, once fairly established, it appears to be as resistant to treatment and to run the same ultimately fatal course as in the dog. This gives Capt. Armfield's communication considerable importance. There may soon be need for a closer study of follicular mange than has been apparent hitherto.

It has to be remembered that the etiology of follicular mange is not yet definitely settled. It is classic to regard it as due to demodices, and to base diagnosis upon the microscopical demonstration of these parasites. Yet in some species of animals, as in man, demodices sometimes occur without causing trouble; and the work of the present century affords grounds for the belief that, in those animals in which the parasite does appear, the real pathogenic factor is the additional presence of the *Staphylococcus pyogenes albus*. That is Gmeiner's view; and the same conclusion was independently reached by Mettam, who successfully treated canine follicular mange by autogenous vaccination. Not very much work has since been done on this line, possibly because the subject has never appeared to be one of economic importance; but it may fairly be said that the disease is still a scientific problem, and that there are few conditions for which autogenous vaccination better deserves a careful and extensive trial. It is certain that the old methods of local treatment by acaricides, upon which much work has been done, have all proved more or less unsatisfactory. It is true that from the classic view of the etiology of follicular mange, it was only to be expected that the inaccessibility of the demodices would render local treatment very difficult; but no one can now feel assured that the classic etiological view is correct.

TWO CASES OF TETANUS.

Case I. A well-bred mare, cast from the army, had run away a fortnight before and sustained some cuts about the legs. A few days before I saw this animal the owner had noticed her going stiffly; he thought it might be lockjaw, and some knowledgeable man told him exercise was good, so *he galloped her daily*, and said after the first minute or two he had difficulty in holding her.

The symptoms of tetanus were well marked, but she had sufficient movement in the jaws to allow her to take enough food to keep her alive. She was in a loose box with open windows, in a slaughterhouse where daily killing was carried on.

Treatment was Chloral hyd. ʒiv. twice daily in the mash. She made an uninterrupted recovery, and was at work in six weeks.

Case II. Bay cart mare, eight years. No perceptible wound or lameness; showing well-marked tetanic symptoms. On the third day swellings developed between the fore legs and under the chest. On the sixth day there was a strong jugular pulse. Owner would not agree to slings, as the animal lay down frequently, and could rise without difficulty. She ate practically all day, but very slowly, and was making some improvement; but got down on the night of the 15th day, and was slaughtered.

Post-mortem showed a decolorised clot extending into the arteries, and extensive valvular disease of the heart.

This mare was a very inconsistent worker; some days she continually refused to pull, and on others worked well. I am inclined to believe that the condition of the heart was the cause of it.

ERNEST MORGAN, M.R.C.V.S.

Faversham, Kent.

STREPTOCOCCI IN EQUINE DISEASES.

A. Pricolo published a suggestive article upon this question in *Il Moderno Zooiatro* of 1911. The streptococcus frequently exists in the blood of the horse, and is easily demonstrated by the simple examination of microscopic specimens or by experimental animal inoculations. Nevertheless, in the diseases caused by the streptococcus, death may supervene without it being possible, at any period of the illness, to encounter the streptococcus in the blood.

Pricolo has found that the streptococcus is always localised by pre-existing lesions. He has encountered it in the extremity in one case of synovitis of the extremity, in the intestine in one case in which that organ contained a large number of

ascarides, in the coxo-femoral joint in a case where that joint was the seat of a traumatic arthritis, and in other such instances. The presence of the streptococcus in pleuro-pulmonic exudates and in the lesions of the genito-urinary mucous membrane in equine infectious paraplegia may be explained by this predilection. In other cases, especially in experimental infections, the localisation results from a purely mechanical phenomenon. The conglomerations and balls which the streptococcus forms in liquid culture media are detained in the finer capillaries. Localisations in the eye, brain, and kidney may be explained in this latter manner. When it has once entered into the blood, the streptococcus does not appear to have any especial election for this or that tissue, or it would be better to say that all the tissues are equally suitable for its growth.

The injection of streptococci into the veins and under the skin provokes various troubles in the horse. Acquired immunity against a homologous streptococcus is never absolute, as the horses succumb to massive doses and even to merely exaggerated ones. In this last case predisposing causes which determine anaemia (pre-existing lesions, etc.) play an essential part.—(*Revista de Higiene y Sanidad Pecuarias*).

Post-Seric Tetanus.

In the "Annales" of the Pasteur Institute of 1917, there is an article by A. Lumiere upon post-seric tetanus—tetanus which appears after the preventive use of anti-tetanic serum. The author has had considerable experience of the subject; and has arrived at the following conclusions:—

1. Preventive injections of anti-tetanic serum do not possess an absolute and unlimited prophylactic action.

2. The duration of the immunity conferred by the serum cannot be fixed. It depends upon the relative proportions of toxin and of preventive serum in conflict in the organism.

3. Cases of post-seric tetanus appear to be due to the two following principle causes:—

a. Super-abundant secretion of toxin in the region of the wound, out of proportion with the dose of preventive serum injected. These are cases of *early* post seric tetanus.

b. The liberation, by a secondary surgical operation or a traumatism, of tetanus spores latent in the tissues, when the activity of the anti-toxin has become exhausted. These are cases of *late* post-seric tetanus.

4. Early post-seric tetanus may be avoided in the majority of cases by surgically cleansing infected wounds, carefully removing foreign bodies which they may contain, providing ample drainage, and repeating the injection of serum one or several times.

5. Late post-seric tetanus is also avoidable in more than half the cases, by injecting a fresh dose of serum at the moment of secondary surgical operation.

6. Preventive sero-therapy sometimes impresses special characters upon cases of post-seric tetanus, more or less altering the symptomatology and clinical course of the disease.

7. In a certain number of cases of post-seric tetanus (15 out of 54 personal observations of the author) the injection of the anti-toxin has prevented the fixation of the microbial poison upon the central nervous system, limiting its action to the motor nerves of the wounded member. These cases of localised tetanus without trismus are much less grave than other forms of the disease.

8. In some other cases (13 out of 54) the bulbo-medullary centres were only partially protected. The appearance of a tardy or incomplete trismus was then seen, accompanying the local contraction. The prognosis is these cases is less favourable than in those previously mentioned.

9. When the anti-toxin has not preserved the central nervous system, trismus is most frequently (26 cases out of 54) observed from the commencement of post-seric tetanus. These are the cases in which prognosis is the most serious.

10. The treatment of post-seric tetanus appears to require the administration, as early as possible, of large doses of serum.

Hitherto curative treatment does not exist; but but the symptomatic manifestations should be treated. Nothing can be done against permanent contraction; but paroxysmal spasms may be treated with sedatives, such as chloral or morphine, or with injections of sulphate of magnesium or per-borate of sodium. The author prefers the last-named substance, on account of its efficacy and feeble toxicity.—(*Revista de Higiene y Sanidad Pecuarias.*)

W. R. C.

THE CENTRAL VETERINARY SOCIETY.

[National V.M.A.—Southern Branch.]

An ordinary general meeting was held on Thursday, December 6th, at 10 Red Lion Square, London, W.C., the President, Prof. G. H. Wooldridge, occupied the Chair.

The following Fellows signed the attendance book:—Messrs. J. B. Buxton, W. R. Clarke, G. S. Heatley, H. D. Jones, W. S. King, J. W. McIntosh, H. J. Parkin, J. Rowe, W. N. Thompson, J. Willett, and Hugh A. MacCormack, Hon. Sec.

Visitor: Capt. J. Malcolm Armfield, A.V.C.

On the motion of Mr. McIntosh, supported by Mr. Thompson, it was agreed that the minutes of the previous meeting should be taken as read.

Correspondence. The Secretary announced the receipt of a letter from the Hon. Treasurer, regretting his inability to attend on account of the indisposition of his wife.

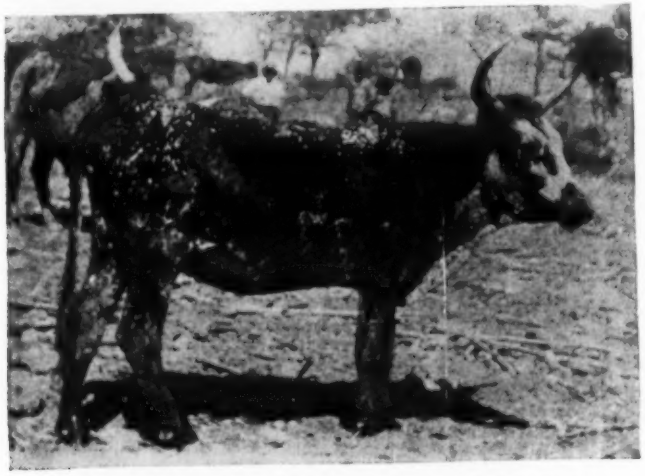
Mr. Perryman had written to the effect that he was detained by important cases.

In response to the letter which he (the Secretary) had addressed to Prof. Macqueen, the latter had replied tendering hisr esignation. This resignation was formally accepted on the motion of Mr. McIntosh, seconded by Mr. Rowe.

A FEW DISEASES AFFECTING ANIMALS IN NORTHERN RHODESIA.

By Capt. J. Malcolm Armfield, A.V.C.

Mr. Chairman and Gentlemen,—I hope you are not expecting a scientific discourse on Tropical Veterinary Medicine. I have striven rather to give you a brief account of several diseases not met with in the British



UNCLASSIFIED SKIN DISEASE IN A NATIVE COW.

FOLLICULAR MANGE.
The animal on the left shows typical old-standing lesions on the neck.

UNCLASSIFIED SKIN DISEASE. Piece of hide almost covered with lesions.

Isles, whilst mentioning the home diseases also found in Rhodesia; also to sketch the general conditions under which stock are raised in the country.

I have lately returned from a three years sojourn in North-Western Rhodesia. This territory is bounded on the north by the Belgian Congo; on the south by Southern Rhodesia, the river Zambesi being the boundary line; on the east by German East Africa and Portuguese East Africa, and on the west by Portuguese West Africa; and so it is really to all intents and purposes Central Africa. Its degree of latitude is between 10° and 20° S., and 20° and 30° E. longitude. The district where I was stationed is nearly 2000 miles north from Cape Town. There is not what we should call a town in the whole territory: the capital, Livingstone, being merely a Government settlement, with a population of about 100 to 200 white people. Neither are there any made roads; in their stead one finds rough wagon tracks and Kaffir footpaths.

The seasons are the opposite to those in England. Our winter is your summer, and *vice-versa*. We get all the rain in our summer, and during the period from April to October—our winter, not a drop of rain falls. In the daytime only the lightest clothes are needed throughout the year, but for several months in the winter season it is rather cold at nights, and a fire in one's house is very acceptable.

My station was 4000 feet above sea level, and at this height one does not experience any very excessive heat, except during the last six to eight weeks before the first rains. There are no hedges or fences—the cattle are herded by natives, and driven into kraals at night. (An African kraal is an unroofed enclosure, varying it structure from a mere circle of thorn branches to a post and wire erection). In the wet season the cattle often stand to their knees in mud and filth, a state of affairs which reminds one of the condition of some of our horse lines in Flanders at the present time. With the exception of valuable imported stock, cattle are entirely dependent on the veldt for their means of support.

Cattle owned by European farmers are principally the indigenous breeds of the country. These are much inferior to our European breeds in size, quality, and milk-producing capacity; but on the other hand, speaking generally, are far more resistant to the dieeases which attack imported stock. Farmers are now importing bulls from the British Isles and the Union of South Africa, in order to cross-breed with native stock, and thus produce an improved strain, and one more resistant to disease. Herefords are the most popular breed for importation, and there are now a large number of half-breds and quarter-breds produced from these sires.

A well built cattle dip is an absolute essential on a Rhodesian farm; chiefly to eradicate the various species of ticks which infest all animals. Besides being the transmittors of various specific diseases, such as piroplasmosis (red water), anaplasmosis (gall sickness), and East Coast Fever (Rhodesian red water), the ticks by the mere abstraction of blood can seriously impoverish, and even kill cattle, particularly in the dry season when food is scarce. For the sake of experiment, I once pulled off 400 blue ticks, engorged with blood to the size of an English pea, from a cow, and found on the following day I could easily strip off an equal number from the same animal. The dip also plays an important part in the prevention and treatment of various manges.

I often used to remark to the Medical Officer that each of our professions had one main piece of advice to settlers. His to advocate the regular taking of quinine ours to insist on the presence of a dipping tank. The patient who does not take quinine gets little sympathy from his doctor, similarly the farmer who will not build a dip is the bugbear of our profession.

Skin Diseases.

Follicular Mange. In *The Veterinary Record* of Nov. 17, 1917, in an article on Mange, by "F.R.C.V.S.," the following extract appeared:—"The demodex mite of man and of domesticated animals other than the dog does not call for a lengthy note, but I wish to report a demodex case on the horse associated with psoroptic mange of the horse." In the face of this statement, the serious menace from demodectic mange in cattle, which I am about to report, may be of interest. A similar state of conditions has recently been reported from Nyasaland.

This troublesome form of mange was very prevalent amongst cattle on the farms in my district. When moderately advanced it appears quite resistant to treatment, and finally causes death. In this respect it agrees with follicular mange of the dog in this country, or what is popularly called "red mange." The causal organism is the *Demodex folliculorum*, and can be found very easily in great numbers in the pus from skin nodules of affected cattle. It appeared to me to be slightly different in shape from the canine organism, but I have found undistinguishable parasites in goats. I am informed that two microscopically proved cases of follicular mange have occurred amongst army horses (somewhere in England) since the outbreak of war I have never seen a case in the human subject, although the text-books report benign and easily curable cases.

You will all fully appreciate the difficulty in persuading farmers that moderately advanced cases are incurable, for, as in the dog, temporary cures may be often effected.

Symptoms in cattle. The primary lesions take the form of spherical nodules about the size of a horse bean, in the thickness of the skin. These generally appear on the shoulders and neck, but may be seen in any part of the skin. In this stage the disease is often unrecognised by laymen, or, if their attention is drawn to it, they attribute the condition to fly bites and other comparatively harmless causes. The disease is slow in progression, especially when the animals are regularly dipped.

During the next stage these nodules increase in number until in many cases they are present in the entire skin of the animal. Finally they burst spontaneously and discharge a creamy pus-like substance. If one opens an unripe nodule a more or less firm kernel spurts out. The last stage is very repulsive and unsightly. The skin of the dewlap, shoulders, and round the eyes becomes denuded of hair, corrugated, and of a dirty grey colour.

The character of the eruption and the course of the disease vary a great deal. The disease in many cases has been found to remain practically stationary in the primary nodular form for at least eighteen months, if not longer. Its course is accelerated by debilitating conditions, the most common of which are tick infestations and scarcity of food, as occur during the dry season in Rhodesia.

Treatment. As already indicated, "prevention is better than cure." New purchases should be carefully examined for the least sign of a nodular eruption, and as far as practicable clean cattle should be kept away from other herds. Regular dippings in dips of known strengths, disinfection of, and cleanliness with regard to cattle kraals, all tend to prevent an outbreak. If follicular mange is already present in a herd, separate the clean from the unclean and proceed to destroy all advanced cases, burning the skins of animals thus destroyed. The milder cases should be strictly segregated (*i.e.*, herded in separate kraals by separate boys) and dipped weekly.

In the majority of herds there are only a few really bad cases, although very frequently a great number of mild ones, so that the farmer need not imagine he is going to cripple his resources by following this advice.

Curative measures take quite a secondary place; they are always dangerous unless strict isolation can be observed; it is advisable only when there are many quite moderate cases, which may be prevented from becoming too bad to work or cured sufficiently to render them fit for slaughter for native consumption. It is doubtful whether even mild cases can be so cured that a relapse is impossible.

An unclassified disease of cattle. There is a peculiar skin disease, occurring in Northern Rhodesian cattle. According to reports it is very similar, if not identical with one found amongst cattle in Egypt, East Africa, and the Belgian Congo. Our department is at present investigating the cause, and there is reason to believe that very shortly the causation will be cleared up. Articles have appeared in the veterinary papers from the pens of Belgian officials in which the causal organism was given out to be a specific fungus.

The specimen here to-night was cut off a sun-dried hide, in which practically the whole surface was as per sample; and I think you will agree it gives a good example of the intensity of the ailment. The photograph also shows a typical distribution on the living animal.

Symptoms. This particular eruption frequently is co-existent with follicular mange lesions.

It is often observed across the loins, on the udders of cows, on the scrotum of the bull, and between the thighs, and takes the form of numerous small wart-like processes about a quarter inch in diameter. If one of these processes is pulled off a small hollow is left in the skin. It does not appear to interfere with the general health of the animal until the amount of skin affected renders its physiological function almost useless. Then the animal wastes and dies. In advanced cases a putty-like coating may completely cover the udder and teats, and this is too hard to be removed by the application of lotions, etc.

Contagion. Experiments were carried out to ascertain if the disease was contagious.

Powdered crusts from an infected animal were rubbed into the coats of clean animals, and also bound into others with bandages, but the disease was not transferred by these methods, although clean animals herded for several weeks with diseased animals became infected.

Treatment. Moderate success was obtained by softening the crusts with soft soap and warm water, and applying a solution of calcium sulphuret. This concoction is made by mixing the following ingredients:—

Quick lime	...	1 lb.
Sulphur	...	2 lb.
Water	..	2 galls.

and simmering over a slow fire for three hours. The solution is applied while warm; but this procedure is of no avail in advanced cases.

Some investigators decry the use of general dressings and hold that they tend to spread the disease from one part of the skin to another. They advocate picking off the individual crusts, and painting the raw surface thus obtained with 1 % picric acid solution.

Paralyses.

Posterior Paralysis. This is an unclassified disease, which, since the year 1914, has cause a high mortality amongst imported cattle, in which the main symptom is progressive paralysis.

I am indebted to Major F. Chambers, A.V.C., for details of his investigations carried out in N. Rhodesia during 1914 when he was G.V.S. in this territory. In the course of these investigations Major Chambers visited Sir Arnold Theiler and Prof. Hedinger, who were carrying out investigations on Lamziekte (Dutch for lame sickness) in the Union of South Africa. Subsequently he states that "Theiler and Hedinger were both of the opinion from the description, temperature records, photographs, etc., that we were dealing with a disease closely resembling Lamziekte; the great points of resemblance are the absence of organisms in the blood, the paralysis of the hind quarters, the absence of paralysis of the fore quarters, and the peculiar trembling of the muscles when an attempt to rise was made, the retention of sensation in the hind legs, and the non-interference with the digestion."

A few months ago I myself had the pleasure of spending nine days at the laboratory at Pretoria, and in discussing posterior paralysis with Sir Arnold Theiler he informed me that he is of opinion that posterior paralysis is a different disease from Lamziekte. The symptoms are different, chiefly the rapid course frequently observed in posterior paralysis. In this disease all power in the hind limbs has been known to have been lost in 14 days.

At present, as in the case of lamziekte, the cause has not been definitely ascertained. After a considerable amount of research work Chambers very strongly suspects sarcosporidia. He states that he very rarely found well-marked sarcocysts exhibiting a well-defined capsule, and presumes that it is due to the non-possession of this membrane that posterior paralysis is so invariably fatal, as the possession of a thick membrane would tend to hinder the diffusion of the specific toxin which is said to be generated by the sarcocyst.

Numerous sarcosporidia were found in the gluteal and gastrocnemius muscles, and pathological alterations due to these parasites were found to have taken place in the semitendinosus and other muscles of the hind limb.

In the case of lamziekte some very interesting grazing experiments were carried out, in which it was discovered that animals on certain grazings contracted the disease but animals fed on cut grass from these same grazings remained healthy. This pointed to an organism in the grass being the causal agent. No experiments of this nature have been performed with regard to posterior paralysis. This leaves open a large field of research to future investigators of posterior paralysis.

Animals attacked. Imported bulls, their half-bred progeny, native cattle (rare instances in the latter).

Mortality. In the great majority of cases the disease is fatal, although I have seen animals which have apparently completely recovered.

Symptoms. Gradually increasing paralysis of the hind limbs, while the general health of the animal remains normal. First the animal is observed to knuckle over at one or both hind fetlocks, and then to drag the toes. Later he rises with difficulty, often horse-fashion—fore-legs first. Later he cannot get up without assistance; finally he cannot get up at all, and so remains lying down, but otherwise in good health, bowels, temperature, urination, etc., normal. Bed sores appear, and eventually he gets into a poor condition, and if not destroyed death steps in as a happy release. Death may occur in a fortnight but usually the course of the disease is more prolonged, in some cases for several months.

On pricking the hind limbs with a pin no loss of feeling is observed.

Treatment. Nothing has been found to prevent or cure this disease. Some have reported a certain amount of success from regular dosing with strychnine. I know of one case which made a recovery after a prolonged attack, and which was treated with a vaccine procured from the blood of a beast recovered from the disease.

Ephemeral Fever, or Three-days' Sickness in Cattle.

This is another form of paralysis occurring in bovines of N. Rhodesia, but it is of a much less serious nature than the preceding one. Mr. W. Kennedy, M.R.C.V.S., British South African Protectorate, gives a short *résumé* of the disease in the *Veterinary Journal* of March, 1915, and it is from this account and from several cases I have seen myself that the following short description is derived :—

The disease was first noticed in N.W. Rhodesia in 1906 ; a few months later it spread to the Transvaal and Natal. Cases have since appeared in the neighbourhood of Nairobi, British East Africa. Also, the natives in certain districts in Uganda have described a disease of cattle with apparently identical symptoms. The disease can be transmitted to a healthy animal by inoculating blood drawn from a sick animal. I have not heard any details as to the morphology of the organism, so presume it has been relegated to the ever-increasing class known as the ultra-visible organisms.

Symptoms. The chief symptom is paralysis of the limbs and consequent inability to stand. The disease comes on rapidly, and disappears with equal rapidity, the animal as a rule being on its feet again in about 48 to 72 hours ; hence the popular name "three-days' sickness."

There is a rise of temperature, in some cases to 106, accompanied by the usual symptoms, and a watery discharge from the mouth and nose. Practically, the only constant post-mortem symptom is enlargement of the lymphatic glands, particularly those in front of the sternum. (Kennedy.)

Sometimes many cattle are attacked simultaneously, which naturally greatly alarmed transport riders and others before the nature of the ailment was understood.

Mortality. Revovery is the rule, but transport oxen should not be inspanned for at least a fortnight after they have regained their feet ; they are quite unfit for work earlier. (Kennedy.)

Immunity. Mr. Freer, of Cape Colony, states that in a large percentage of cases one attack confers immunity for a considerable time, but that numerous cases have been observed by him where cattle have been subject to two or three attacks. This writer also says the second attack is usually worse than the first.

Treatment. It is best to leave this entirely to nature. If purgatives, etc., are given by the mouth great care must be taken, as there is often difficulty in swallowing, probably due to semi-paralysis of the gullet.

Contagious Bovine Pleuro-Pneumonia.

During my residence in the country, I had the opportunity of observing an outbreak of contagious bovine pleuro-pneumonia, or lung sickness, as it is called by South Africans.

Too many animals were concerned to allow of slaughtering in-contacts. The programme we carried out with considerable success was quarantining affected areas, slaughtering visibly affected animals, and inoculating as many in-contacts as was possible in an extensive territory manned by a very small veterinary staff. We worked under extreme adverse conditions, and I, for one, was agreeably surprised to find that the disease was prevented from spreading to any great extent.

Capt. E. H. Brogan, who had the opportunity of going thoroughly into the question, informed me that he considered the procedure of extensive inoculation justified by results.

Arsenical poisoning from dipping. In a country where a great number of cattle are regularly dipped it is not surprising to occasionally come across arsenical poisoning resulting from this procedure.

I remember one particular occasion in which the deaths of eight animals occurred. Cooper's cattle dip had been used. This fluid contains sodium arsenite together with other ingredients and is very universally used in N. Rhodesia. The herd consisted of about 100 head of cattle, and had been driven some eight miles to the tank and taken home the same day after dipping. The owner declared that he did not observe any animals to drink the dip, and that they had been offered water beforehand.

Symptoms. Diarrhœa of a normal green colour, in some cases exceedingly liquid. It never was particularly offensive. In some animals the fæces were slightly more firm than normal and coated with mucus. The animals showed distinct stiffness of one or both hind limbs, and a reeling gait. The eyes were glazed and sometimes the tissues around them were swollen. On taking the temperatures I noticed considerable inflammation of the rectum. The animals finally lay down with their head turned toward the side.

The temperature ranged from 1 or 2° below, to 2° above normal.

In tropical countries one cannot place too much reliance on the thermometer. I have often observed normal cattle to have a temperature of 2 to 3° on hot evenings, particularly after having been chased in order to capture them.

Post mortem. The examination revealed intense inflammation of the fourth stomach, the mucous membrane throughout was a deep claret colour, and the ingesta of a reddish hue. The other stomachs were normal, except in one case, where the mucous membrane of the rumen showed considerable inflammation and peeled off easily. The rectum was inflamed in stripes, reminding one of red and white candy sticks. The kidneys showed slight congestion. The liver was friable, particularly so in one case.

Conclusion. My diagnosis was :—Arsenical poisoning due to drinking either the dipping fluid itself or water from a small stream contaminated with dip. The stream in question was near the dipping tank, and the animals were allowed to drink from it before being dipped.

Another large herd of cattle had frequently passed through this stream after being dipped, and at the time in question the stream had become dammed a little lower down, and so was collecting arsenic from the limbs of recently dipped animals which had walked through it.

In South Africa stock owners are advised to keep the following solutions at hand in case of arsenical poisoning from cattle dips :—

(1) Liq. ferri perchlor. 3 oz.
(2) Carbonate of soda, 1 oz. Aquæ, ad 12 oz.

Instead of Ferri perchlor. 1 oz. of Ferri sulph. may be employed.

Directions. Mix the two solutions immediately before use, and repeat the dose every ten minutes until the symptoms disappear. Follow in two to three hours by a dose of Magnesium sulphate.

One needs to make a selection in writing a short paper. I have picked out those diseases with which I came most in contact, and which I considered would be of interest owing to their being out of the ordinary run.

However, it is as well to mention that the following important contagious diseases are encountered in N. Rhodesia :—Anthrax (chiefly in certain districts) ; Trypanosomiasis (confined to fly areas) ; Piroplasmosis and Anaplasmosis (chiefly in imported stock) ; Black Quarter (very rare) ; Rabies.

It may interest you to know that N. Rhodesia is at present free from the following formidable diseases :—East Coast Fever (Rhodesian Red Water) ; Rinderpest ; Tuberculosis ; Glanders ; Foot-and-mouth disease.

East Coast Fever is causing considerable anxiety in S. Rhodesia and in the Union of South Africa. Rinderpest has existed in German East Africa for a consider-

able time. The absence of tuberculosis is due to the open-air life enjoyed by Rhodesian cattle, and maintained by the careful testing of animals imported into the territory.

Pigs.

Pigs do well in Rhodesia, as there is no swine fever or tuberculosis in the country. Some farms have a great number of wild figs which eke out the porcine bill of fare. When maize, the chief crop, is cheap, it pays to feed it to swine. There is a bacon factory at Salisbury, S. Rhodesia, to which growers of pork can send carcases.

The native pigs are small, slow in reaching maturity, and have long noses. To make pigs pay one must have imported stock of the ordinary European breeds. I have seen a few cases of measly pork, which is not surprising when one bears in mind the number of natives in the territory, and their free and easy habits.

Sheep.

There are no wool breeds in N. Rhodesia, although South Africa does a considerable export trade in wool. The Rhodesian sheep are the hair breeds, as the Persian. Lately they have done badly on most farms, owing to strongyle infection of the intestines and stomach. I have observed the *Strongylus contortus* and no doubt other European gastric strongyles are present.

Dr. Veglia, an Italian V.S., on Dr. Theiler's research staff at Pretoria laboratory, has just worked out the life history of the *Haemonchus contortus*.

For some time we have been able to kill these parasites with dosing, but the knowlege of the life history will now enable us to dose at set intervals, and so get rid of all the parasites.

The principle of eradication is the same as dipping in cattle, the sheep collect the worms, are dosed with a special mixture which kills the worms, and so in course of time the sheep itself collects and kills off all the parasites.

I will not give more details, as these no doubt will shortly appear from the pens of the research workers themselves.

Sheep also in some parts are extensively infected with tape worms. The settlers give the name bottle-jaw to the resulting disease, as an oedematous swelling under the jaw is one of the symptoms.

Horses.

Horses do not do well. On account of the prevalence of *S.A. Horse Sickness* it is about even chance whether an unsalted horse lives through the rainy season.

Dr. Theiler has discovered a very efficient protective inoculation against the disease in mules, and both he and Bevan have had fair results inoculating horses. Probably now complete success is only a question of time.

Donkeys in my district were very healthy, although said to be liable to contract horse sickness. There was quite a number kept, but I never saw or heard of a case of horse sickness occurring in this species.

Dr. Theiler asserts that everything points to the mosquito as the carrier of horse sickness virus.

The chance of horses contracting this plague is greatly lessened by any means adopted to attack mosquitos—fires in the stables, general methods for preventing mosquitos breeding, etc., and with a reliable inoculation against this equine pest, and the whole of South Africa will naturally be enormoufly benefited.

Epizootic lymphangitis. This disease is rather prevalent in the country, but not to the extent of horse sickness. Hardy breeds do best (such as Basuto ponies) which are accustomed to an unhampered life, and can make a good meal off the veldt.

Maize. I have kept horses on maize and what grass they could pick up—no oats or bran, and they have done quite well.

Shoeing. We never, or hardly ever, shoe our horses—just rasp the feet down occasionally.

In conclusion, gentlemen, I should like to remind you that this paper has been rather hastily compiled while on military service. I could have given more details had I not been separated from certain notes, etc., taken down while in Africa. But I hope I have been able to interest you for half-an-hour on veterinary matters in the vast territory which owes its name to Cecil Rhodes, and I thank you all very heartily for the patient hearing you have given me.

The President said that the paper was full of interest, but probably, in view of the lack of experience in this country of the specific diseases mentioned, would not evoke discussion. He extended a warm welcome to Capt. Armfield on behalf of the Society.

Some of the author's remarks confirmed the speaker in the belief, which he shared with many others, that indigenous cattle were more resistant to local diseases than were imported stock. It would be interesting to find out whether the immunity in question were natural or acquired. It was far more probable, at any rate in many cases, that the animals had been exposed to infection in small quantities from early life, and had so gradually developed immunity or tolerance against local infections. If that were so, the immunity was rather an acquired than a natural one. It was not impossible to establish the fact, but it might be difficult.

[Capt. Armfield here suggested that experience seemed to confirm that view, as piroplasmosis was found in native cattle].

Continuing, Prof. Wooldridge said that he had been interested to hear Capt. Armfield's account of follicular mange in cattle, and to see the photographs which had been shown. In other animals, such as the dog and pig, follicular mange was not common in this country. There were a certain number of cases in horses, and probably it was more common with horses than was generally believed, owing to the circumstance that it was not looked for. He did not, however, think that in these instances the malady ever gave rise to such extensive lesions as were shown by the photographs exhibited.

The character of the lesion was apparently different in the case of the North Rhodesian cattle, causing nodules as big as horse beans. On account of the dissimilarity between this form of follicular mange and that occurring in dogs, suspicion, unless accompanied by investigation, would be likely to be disarmed. Apparently, there was no greater success in the treatment of the disease in the Rhodesian cattle than in dogs in this country—often temporary improvement is followed by disappointing recurrences; complete cures were rare except in very early cases.

The other skin disease to which Capt. Armfield had referred was interesting, and the interest was intensified by the exhibition of the piece of skin. He would not hazard any suggestion as to the cause or treatment of the condition, but it was to be hoped that attention having been drawn to the subject, the cause would be elucidated, and also the treatment. He had been struck by the fact that the rubbing in or bandaging on to the skin of scrapings of the diseased matter would not reproduce the disease, while the circumstance that healthy animals were allowed to cohabit with diseased ones rendered the former liable, in a matter of six weeks or so, to show symptoms of the malady. This suggested the possibility of some intermediary bearer—a fly or tick—and the possibility of a causal organism undergoing some modification when passing through the intermediary bearer; the suggestion, however, had only imagination to support it.

The posterior paralysis mentioned by the author was a condition not met with in this country. To the

speaker, the chief point of interest was the suggestion that the condition was due to sarcosporidiosis sarcospores had been credited with producing serious muscular symptoms at various times, but sarcosporidiosis was not very uncommon here. In sheep it affects the muscles of the hind limbs and other parts, but the speaker was unaware that it is responsible for any serious symptoms—certainly nothing comparable to posterior paralysis. It was quite possible that the presence of sarcosporidia may have had nothing to do with the cause of posterior paralysis, although they may have been co-existent.

The treatment for arsenical poisoning quoted by Capt. Armfield was, of course, well known and proved—namely, the administration of moist peroxide of iron freshly prepared. It was hydrated oxide, produced simply by the admixture of carbonate of soda and solution of perchloride of iron. When this preparation came into contact with the arsenic in the stomach it produced insoluble arsenite of iron, and was removed by the dose of Epsom salts recommended. The treatment was a very useful one, and the main feature about the suggestion was this—that it was presented to stock-owners in a way easy of application.

It was interesting to hear that there was a prospect of an effective preventive vaccine against Cape horse-sickness—the bane of horseflesh in the horse-sickness zones; if a preventive serum or vaccine could be produced, it would go a long way in assisting the development of the country. The success which had apparently been obtained with mules should not be very difficult to obtain with horses. He hoped that such a success might be achieved soon. The speaker concluded by again thanking Capt. Armfield for submitting his interesting paper.

Mr. J. WILLETT, after commenting upon the lack, in this country, of an experience similar to that brought forward by Capt. Armfield, enquired whether, in the case of inoculation for pleuro-pnemonia, the vaccines were prepared in the laboratory. Capt. Armfield replied that the vaccine was carefully removed with a cup from the chest of a dead beast, and used forthwith. A piece of worsted was dipped into the cup and threaded through the tail. The wool was not drawn through but left in.

Mr. Willett further enquired whether tetanus was often met with, and was told that occasionally tetanus was met with, but it was rather uncommon. In the course of several years' experience, Capt. Armfield had only met with one case.

Capt. ARMFIELD believed that the obscurity surrounding the skin disease would be cleared up soon; of course, not much research work was done. He had left a piece of skin with Dr. Theiler, who had started investigation, and would probably report before long. In answer to the President, he stated that the projections when pulled off left a cup-like lesion. He could not say whether the growth was epithelial or fibrous. Several sections had been examined, but nothing was found. They could be teased up in the fingers. The growths were he believed not fibrous, but were like warts. In reply to questions as to how far the mucous membranes or vulvæ of the animals were affected, he stated that he had never seen the manifestations anywhere but on the external skin; they generally started between the hind legs, not in the vagina or perineum. The protuberances were like putty when set hard. Capt. Armfield had only met the disease in cattle, not in horses; but, of course, there were very few horses in the country. He did not think human beings were affected.

SPECIMENS.

The PRESIDENT exhibited three testicles from monorchids, to which he referred as Nos. 1, 2 and 3, according to size. The small one, weighing three ounces, was from a yearling colt, and was present in the inguinal canal; he had no difficulty in removing it. The second case was that of a two-year-old colt, from the same mare as No. 1 and by the same sire, the specimen having been present in the abdominal cavity. When first found, he had had difficulty in recognising it on account of its enormous size, about that of a child's head. When he had brought it to the inguinal canal he was able to secure it by the cord. It contained a large amount of liquid, which he had to remove by means of trocar and cannula. This liquid escaped through the inguinal canal, and he estimated that he had removed at least a pint. The weight of this testicle, minus the liquid, was 16½ oz. The third testicle was from a two-year-old colt. The animal had the same sire as the other two, and, unfortunately for the owner, all belonged to the same man. When first asked to operate on three rigs, he concluded that the owner had been making a collection of rigs, but it was an involuntary collection. The speaker had considerable difficulty in identifying this large testicle, quite as large as a man's head. It was some time before he found it, freely movable in the abdominal cavity, having a long spermatic cord, about half as thick as his wrist. Sometimes he touched the testicle with the back of his hand, and he thought it to be a portion of the large intestine; when he attempted to get his hand round it, so as to feel more of it, it disappeared, and he could only feel the large colon. The search occupied a long time, until, eventually, in despair, he made a sweep round the whole abdominal cavity, and found what he sought in the flank opposite to that in which he was operating. On bringing the cord to the inguinal canal he secured the testicle, pulling it towards the internal inguinal ring. He found it filled with fluid, and again resorted to the trocar and cannula, and estimated the liquid removed at about a quart. He was then able to extract it, through the inguinal canal. The weight of that testicle, minus the fluid, was 2½ lb., or 40 oz. avoirdupois. It was an interesting circumstance that all these animals were by one stallion, so that he wondered whether there was anything hereditary in the cases. The matter was complicated by the fact that the yearling and one two-year-old came out of the same mare. He had asked the practitioner to make enquiries in his district to learn if any other colt by the same horse had been a rig. At present he had no news.

In reply to questions, Prof. Wooldridge stated that all three animals got up from the operation. Cases 1 and 2 made uninterrupted recoveries. Case 3, owing to the very large dilatation of the canal, necessitated the application of a clamp, which he put on after suturing the the skin. As there was no spare skin he did not want the clamp left on long, and it was, in accordance with his instructions, removed the next day. The horse went on well for six days, when the practitioner was called in, and was told that something was showing. Examination indicated a loop of bowel, and the practitioner put the horse down, returned the bowel and sutured. On the fifth day following the prolapse the horse died from peritonitis—apparently consequent upon the prolapse.

Replying to Mr. Willett, Prof. Wooldridge stated that the opening was wide: he had his whole arm in for a long time. It did not astonish him—considering that with a quart of liquid in it, the testicle was bigger than a man's head—that he had been unable to identify the testicle in the abdomen. He had been unable to get round it, and it almost resembled one of the flexures of the colon.

HORSE AMBULANCE FOR THE FRONT.

On the motion of Mr. McIntosh, supported by Mr. J. Willett, the following resolution was put to the meeting and unanimously carried:—"That there shall be a recommendation to the Council that a donation be made to the Master Carmen's Association Fund for Horse

Ambulance for France, and that the next meeting of Council shall take place at an early date."

FOOD-STUFFS FOR HORSES.

After some informal consideration of the question of the food now supplied to horses and of the general condition and health of these animals, it was suggested that Mr. Jones be asked to collect any evidence available in connection with these matters, in order that they might form the subject of discussion at the next meeting of the Society, preparatory to approaching the authorities concerned with the provision and distribution of food for horses.

At the request of the President, Mr. Jones consented to collect, as far as possible, the evidence deeired, and to introduce a discussion on the subject.

The proceedings terminated with a vote of thanks, proposed by Mr. Willett, seconded by Mr. Rowe, and cordially supported by Mr. McIntosh and the President, to Capt. Armfield for the paper which he had communicated to the Society; followed by a vote of thanks to the President.

HUGH A. MACCORMACK, Hon. Secretary.

COCCIDIOSIS IN THE HORSE.

Sir,

In a report of a meeting of the North Midland Veterinary Association which was published in *The Veterinary Record* for the 29th September last (No. 1525), page 131, there appeared an account of a case of alleged coccidiosis in the horse.

A description of this case was given by Mr. S. E. Sampson, who stated that he had submitted a portion of the horse's intestine to Mr. H. R. Lewis, and that he (Mr. Lewis) had "found present on and in the mucous membrane large numbers of a coccidian parasite which had caused the disease from which the animal had suffered. The parasite is circular in shape and measures only 3 mm. in diameter, it penetrates the epithelial cells, which become detached and finally destroyed. There is a shedding of the dead portions, and this gives rise to the roughened appearance of the mucous membrane of the bowel." Mr. Sampson added that he believed the disease was very rare in horses in this country, and that at least very few if any cases had been recorded.

This opinion rather understates the facts, for so far as I am aware there is not on record anywhere a well-authenticated case of coccidiosis in the horse.

Shortly after the report of this case appeared I wrote to Mr. Sampson, stating that I was anxious to compare the parasites found in the horse with the coccidia of other animals, and that I should be greatly obliged if he would send me one or two preparations showing the parasites, or a piece of the diseased intestine. In reply to this letter Mr. Sampson referred me to Mr. Lewis, who had the preparations on which the report was based.

I then made the same request to Mr. Lewis, and he was good enough to send me two mounted sections, one from the intestine and one from a mesenteric gland, both of which in his opinion showed the coccidia. In an accompanying letter he called my attention specially to a marked place in the section from the mesenteric gland.

On examining both of these sections I was unable to detect any coccidia, or indeed anything remotely resembling coccidia. In the submucous coat of the intestine, and also in the substance of the mesenteric gland, there were some microscopic foci composed of small cells, but the mucous membrane of the intestine appeared to have been healthy, and certainly showed nothing suggestive of coccidiosis.

Attention may be called to the fact that the coccidia were described as having a diameter of 3 mm. That, of course, is a wholly incredible size for a coccidium, and I therefore assume that what was meant was 3 microns; but even that hypothesis would cast doubt on the accuracy of the diagnosis, as none of the species of coccidia found in any of the other domesticated animals is anything like so minute.

It will readily be understood that it is only a sense of duty which compels me to record the facts narrated above. It is very important that no case should wrongly pass into literature as a case of coccidiosis in the horse.

I have had a large experience in examining coccidia from the rabbit, the sheep, the goat, the ox, the fowl and other birds, but I am not so arrogant as to suppose that my view with regard to this case will be accepted by everyone as conclusive evidence against the accuracy of the diagnosis made by Mr. Lewis. I merely wish the difference of opinion to stand on record.—Your obedient servant,

Royal Vety: Coll: J. M'FADYEAN.
London, N.W. 1.
Dec. 24, 1917.

UNDIAGNOSED.

Sir,

I must thank Messrs. Brown and Lloyd for recording their cases. One thinks that all are the same disease, and very interesting.

I would like to add that I sent to the County analyst some of the contents of the intestine from the colt upon which I made the post-mortem. He reports as follows:

"I have made a very careful examination for all the ordinary poisons, both mineral and organic, and have proved their absence."

The field in which this colt was pastured contained no oak trees.

I am told that in the pasture in which the other pair were there were acorns.—Yours faithfully,

Northallerton, E. H. PRATT.
Dec. 30, 1917.

THE LAW OF LIGAMENT.

The following enunciation of a "law" occurs in one of a series of lectures by Prof. Arthur Keith, M.D., F.R.S., on "The Anatomical and Physiological Principles underlying the treatment of Injuries to Muscles, Bones, and Joints," at the Royal College of Surgeons of England, November-December, 1917, which appears in *The Brit: Med: Jour:* of Dec. 29:—

"When we examine the principles and practice of Stromeyer, Little, and Adams, all of them pioneers in orthopaedic surgery, we are struck by the importance they attach to ligaments in the production and treatment of deformity; ligaments seemed to them almost as important as muscles. Even now the essential function of ligaments is misunderstood, and so long as this is the case we cannot hope to effect an object which is quite as important as the rectification of deformities—namely, their prevention. Hunter's teaching as regards the respective functions of muscles and ligaments in the mechanism of the human body is very definite. Muscle is the only tissue of the body which can be applied for the continued support of parts without undergoing elongation. A ligament cannot perform that function because it is composed of living passive tissue which must stretch when it is submitted to continued tension. Nature never uses ligaments either for the purpose of passive support or of active maintenance of parts in

position ; she uses them only for the purpose of limiting movements when the muscles which guard and surround a joint are forced beyond the compass of their normal reach.

This law can be best illustrated at the shoulder-joint. In paralysis of the shoulder muscles, or when a patient is deeply anaesthetized, the head of the humerus drops away from the glenoid cavity under the weight of the arm ; the shoulder-joint can then be moved far beyond its normal limits ; the ligaments become then the sole agents which limit movements, and are subject to direct stress. If in the dissecting room we strip the muscles from the shoulder and leave the humerus attached merely by its ligaments, we can see then that in all normal movements they never become taut until the usual limits are exceeded. The real ligaments of the shoulder-joint, as of every other joint in the body, are the active defensive contractile muscles.

Now man's upright position has made him more dependent on the ligamentous function of muscles than any other animal. His shoulders, when he stands up or sits up, have to be steadily supported by muscles—every one of the twenty-four vertebrae of his backbone has to be kept continuously balanced one upon the other ; the contents of his abdomen have to be constantly braced by the contraction of the muscles of the abdominal wall and thus prevented from falling down. Ligaments are useless for such purposes ; Nature never employs them for such ends. We see the same principle applied in the maintenance of the joints of the lower extremities. We cannot stand without the muscular braces of our hip, knee, and ankle joints coming into continuous action. It is easy to demonstrate that the maintenance of the plantar arch owes nothing to ligaments ; that can be demonstrated in the living foot and leg, and also in the dissected parts.

It is quite clear that ligaments are passive parts ; their elongation is not a cause but a consequence of the deformity. In short, in all static deformities of the human body the cause has to be sought for, not in ligamentous changes, but in the disordered action of the muscles, and we shall never succeed in preventing or mending static deformities until the truth of this law of the function of ligaments is clearly realised."

THE MYCOLOGICAL DETECTION AND DETERMINATION OF CERTAIN CARBOHYDRATES AND OTHER CARBON COMPOUNDS IN PATHOLOGICAL WORK. By ALDO CASTELLANI, M.D., M.R.C.P., Lt.-Col. Royal Italian Medical Service (Navy); and FRANK E TAYLOR, M.D., M.SC., M.R.C.P, F.R C.S., Lecturer on Bacteriology, King's College, University of London.

Various carbohydrates and other carbon compounds are currently used in the indentification of certain bacteria and higher fungi. The reverse process may also be carried out, namely, certain hyphomycetes and bacteria presenting permanent biochemical reactions may be used in the determination of various carbohydrates and other carbon compounds in pathological work.

For many years ordinary German yeast has been used in the detection of glucose, but this is the only substance for which, so far, such method of detection has been employed in pathological investigations. As a matter of fact, the method is scientifically incorrect, at least when using the German yeast obtainable in London, for judging by the results of the investigation of several specimens collected by us, this yeast ferments with the production of gas, not only glucose, but several other sugars. When, therefore, gas is thus produced it does not mean with certainty that the sugar present is glucose ; it might be levulose, or some other. To detect glucose recourse should be made to germs really specific for that sugar—germs which will ferment glucose only, with production of gas ; for instance, *Monilia balcanica* Castellani, *Monilia parabalcanica* Cast. We have not specific germs for each of the other sugars and carbohydrates, but as there are a number of species of hyphomycetes and bacteria which select certain carbohydrates to the exclusion of others, we have found it possible, by using certain of these hyphomycetes and bacteria and comparing the results, to devise a general method with the object of assisting in the detection and identification of some carbon compounds, especially certain sugars and other carbohydrates.

General principle of the method.

The three more important sugars which have to be dealt with in physiological and pathological investigations —namely, glucose, lactose, and maltose—are commonly distinguished by their relative powers of reducing Fehling's solution, and by the characters of their osazones ; but they may be distinguished also, in our experience, by a very simple mycological test, which may be carried out as follows :—

Make a 1 per cent. solution in peptone water of the substance which is assumed to be one of the three sugars and distribute it into two tubes, (1) and (2). Inoculate No. 1 with *Monilia balcanica* Cast, or *M. parabalcanica* Cast., or *M. krusei* Cast. Inoculate No. 2 with *M. Pinoyi* Cast., or *M. tropicalis* Cast. Incubate at 37° C. for forty-eight hours, and then read the results. If both tubes present gas, the sugar must be glucose ; if No. 1 presents no gas and No. 2 gas, the sugar must be maltose ; if neither of the tubes present gas, the sugar must be lactose.

M. balcanica Cast., *M. parabalcanica* Cast., *M. krusei* Cast., produce gas in glucose, but have no action on maltose or lactose ; and *M. pinoyi* Cast , or *M. tropicalis* Cast., ferment glucose and maltose, but have no action on lactose. Acid fermentation without production of gas is not to be taken into account. We have carried out the experiment also with certain species of the genus *Saccharomyces*—either with live organisms or their extracts (zymases)

Instead of hyphomycetes, certain bacteria may be used. Thus :—

Inoculate tube No. 1 with *B. proteus vulgaris* Hauser (P.I. strain): inoculate Tube No. 2 with *B. diffluens* Cast. If both tubes show presence of gas, the sugar is glucose ; if No. 1 shows gas and No. 2 no gas, the sugar is maltose ; if both No. 1 and No. 2 show no gas the sugar is lactose.

B. proteus vulgaris Hauser (P.I. strain) does not ferment lactose, while it ferments with production of gas, glucose and maltose ; and *B diffluens* Cast. does not ferment lactose and maltose, but does ferment glucose with production of gas.

[Further details are given as to differentiation of Fehling reducing substances—the six sugars found in pathological urines—with a Table, and a Key; also of a method of procedure if more than one reducing substance is present : and for the detection of certain non-reducing substances.]

Use of the Method in Urine Analysis.

From a number of experiments we have carried out, adding to samples of urine various sugars and other carbo-hydrates, and also from a few pathological specimens, we can say that the method can be used in urine analysis for the detection and differentiation of certain sugars and other substances—glucose, levulose, lactose, pentose, etc.,—provided that the amount of such substances present is not too minute (not less than 0.1 per cent.). The urine is distributed in sterile tubes contain-

ing Durham's fermentation tubes or similar devices and inoculated with the organisms mentioned in the table and key. Two points of considerable importance are (1) the urine must be aseptic; if it cannot be collected aseptically it should be sterilised as soon as possible—after distribution in the tubes—by heating in Koch's steamer for thirty minutes on two or three consecutive days. It should never be autoclaved, as this procedure may alter the characters of the sugars and other carbohydrates present. (2) It is of great advantage to add a third or the same amount of peptone water to the urine before inoculation, otherwise the organisms may grow very scantily, and there may be no production of gas.—*Brit: Med: Journ:*

It is stated, as a result of unofficial tests, that much can be done to remedy the destructive Isle of Wight disease among bees by the use of Flavine—one of the preparations introduced for wound treatment during the present war. It is sprayed in the hives, and added to the bees' food. The cost is minimal.

SUBSCRIPTIONS TO R.C.V.S.

The Secretary of the Royal College of Veterinary Surgeons begs to acknowledge the receipt of the following subscriptions for 1917 :—

H. J. Axe, Lt.-Col. A.V.C., D.S.O.	£1	0	0
R. S. Collihole, Bishop Auckland	1	1	0
W. M. Ferguson, Dundee	1	1	0
W. W. Lang, Major A.V.C. (1916, 1917)	2	2	0
H. A. MacCormack, Tufnell Pk., London, N.	1	1	0
C. E. Perry, Staple Hill	1	1	0
J. J. Plunkett, Capt. A.V.C.	3	3	0
G. Scade, Galston	1	1	0
M. Twomey, Macroom, Co. Cork	1	1	0
Previously acknowledged	928	9	0
	£941	0	0

The Secretary of the Royal College of Veterinary Surgeons begs to acknowledge the receipt of the following subscriptions for 1918 :—

S. J. Marriott, Northampton	£1	1	0
D. Marshall, Capt. A.V.C. (S.R.)	1	0	0
G. Scade, Galston	1	1	0
C. A. Squair, Reigate	1	1	0
D. Sutherland, Thurso	1	1	0
G. H. Williams, Chippenham	1	1	0
	£6	5	0

ARMY VETERINARY SERVICE

War Office, Dec. 11.

The following Dispatch has been received by the Secretary of State for War :—

General Headquarters, Nov. 7, 1917.

Sir,—I have the honour to submit a list of names of those officers serving, or who have served, under my command during the period February 26th to midnight, September 20/21st, 1917, whose distinguished and gallant services and devotion to duty I consider deserving of special mention.

I have the honour to be, Sir, your obedient servant,
D. HAIG, Field-Marshal, Commander-in-Chief.
The British Armies in France.

* * * *

Capt. D. Blyth, Spec. Res.; Temp. Capt. P. Braid; Temp. Capt. A. W. Brasnett; Temp. Capt. J. C. Broad; Maj. T. E. Burridge; Capt. G. H. Butcher; Temp. Capt. F. S. Clay; Temp. Capt. R. B. Coutts; Temp. Capt. T. Dalling; Temp. Capt. J. Edgar; Temp. Capt. J. A. Edwards; Capt. J. R. Ellison; Maj. H. E. Gibbs; Temp. Capt. J. Godber; Capt. D. C. Greene, Spec. Res.; Temp. Capt. W. H. Heaney; Temp. Capt. S. E. Hill; Capt. (temp. Maj.) A. Hodgins; Capt. F. Hogg; Capt. S. E. Holmes, Spec. Res.; Capt. H. J. Hughes; Temp. Capt. C. A. Hutton; Capt. (temp. Maj.) V. C.

DISEASES OF ANIMALS ACTS 1894 TO 1914, SUMMARY OF RETURNS.

Period.	Anthrax		Foot-and-Mouth Disease.		Glanders† (including Farcy)		Parasitic Mange.		Sheep Scab.	Swine Fever	
	Out-breaks	Animals.	Out-breaks	Animals.	Out-breaks	Animals.	Out-breaks	Animals.	Out-breaks	Out-breaks.	Slaughtered.
IRELAND. Week ended Dec. 29	...	...	...	...	...	...	Outbreaks ...		8	...	10
Corresponding Week in 1916 ...	...	...	...	...	...	...	...		24	8	39
Corresponding Week in 1915 ...	...	...	...	...	...	...	1		3	3	10
Corresponding Week in 1914 ...	...	...	...	...	...	...	...		6	1	1
Total for 52 weeks, 1917 ...	3	5	...	...	1	1	45		430	198	1142
Corresponding period in 1916 ...	3	7	...	...	...	...	61		506	317	1986
Corresponding period in 1915 ...	2	2	...	...	1	3	71		412	247	1361
Corresponding period in 1914 ..	1	1	76	957	...	...	78		484	193	967

Department of Agriculture and Technical Instruction for Ireland (Veterinary Branch), Dublin, Dec. 31, 1917

NOTE.—The figures for the Current Year are approximate only.

* As Diseased or Exposed to Infection

Leckie; Temp. Capt. C.K.Lomas; Temp. Capt. J. F. Macdonald; Temp. Capt. H. E. McGee; Capt. S. W. Marriott; Capt. D. Marshal, Spec. Res.; Temp. Capt. A. W. Noel Pillers; Capt. J. J. Plunkett; Temp. Capt. A.R.B.Richmond; Capt. J. R. Rigby; Maj. H. T. Ryan; Maj. J. Scott-Nimmo; Temp. Capt. R. T. Skelton; Temp. Capt. D. Starkey; Capt. T. T. Taylor, Spec. Res.; Temp. Capt. J. L. Williams; Capt. H. M. Williams; Qrmr. and Hon. Lt. J. Wood; Temp. Capt. J. H. Yates.

Sgt. (temp. Sgt.-Maj., W.O. Class I.) G. H. Bickell, 218; Pte. (actg. Sgt.) J. Briggs, SE/4030; Pte. (actg. Cpl.) R. W. Buck, SE/11433; Pte. (actg. Sgt.) T. M. Calder, SE/4507; Staff Sgt. R. Carlisle, SE/14108; Pte (actg. Sgt.) H. De Bolla, SF/4829; Pte. (actg. Sgt.) J. Fleming, SF/1201; Pte. G. E. W. Gosslinn, SE/1168; Pte. (actg. Staff Sgt) C. A. Gundry, SE/10743; Pte. (actg. Cpl.) J. Hardman, SE/10532; Pte. (actg. Sgt.) R. Kew, TT/0672; Pte. (actg. Staff Sgt.) W. Lovick, SF/1267; Sgt. (temp. Sgt-Maj., W.O. Class I.) M. Maloney, 120; Staff Sgt. H. Mee SE/23647; Pte. (actg. Sgt.) A. Neill, TT/01332; Pte. (actg. Sgt.) P. G. Patten, 987; Sgt. (temp. Sgt.-Maj., W.O., Class I.) H. J. Rilett, 217; Pte. (actg. Sgt.) G. H. Robbins, SE/1182; Pte. (actg. Sgt.) H. M. Roberts, SE/1226; Pte. (actg. Sgt.) J. J. Scott, SF/2361; Cpl. (actg. Sgt.) A. W. Stafford, N/424; Pte. (actg. Sgt.) L. Stone, TT/0779; Pte. (actg. Sgt.) J. A. Trowbridge, SE/2971; S.-smith (actg. Farr. Qrmr.-Sgt.) E. Walsh, 174; Pte. (actg. Cpt.) E. J. Wheeler, SE/1280; Capt. E. F. Angler; Capt. G. W. Bloxsome; Lt. (temp. Capt.) G. Green; Capt. J. H. Jones; Capt. A. R. Routledge; Capt. J. F. Taylor; Capt. W. G. Thompson; Pte. (actg. Sgt.) A. Heveningham, TT/03171; Pte. (actg. Sgt.) F. W. Huddleston, TT/0367.

AUSTRALIAN IMPERIAL FORCE.

STAFF.

Maj. M. Henry; Lt.-Col. (temp. Col.) E. A. Kendall; Maj. R. H. F. Macindoe.

A.V.C.

Capt. G. S. Bruce; Capt. R. A. Dowling; Capt. G. F. Finlay; Maj. L. E. McKenzie; Sgt E. G. Chudleigh, 160, 2nd F.A.B.; Staff Sgt. H. H. Hatton, 25; Cpl. C. Kelly, 572; Vet. Sgt. F. T. C. C. Morgan, 296; Pte. W. Taylor, 137; Sgt. W. A. Walls, 203; Sgt. J. Westbrook, 710.

CANADIAN A.V.C.

STAFF.

Capt. (actg. Maj.) T. C. Evans, M.C.; Capt. (temp. Maj.) C. G. Saunders; Capt. (temp. Lt.-Col.) D. S. Tamblyn.

NEW ZEALAND V.C.

Maj. P. M. Edgar; Maj. (temp. Lt.-Col.) H. A. Reid.

DECORATIONS AND PROMOTIONS.

The King has been pleased to give orders for the following promotions and appointments for valuable services rendered in connexion with military operations in the field (dated Jan. 1, 1918):—

THE MOST HONOURABLE ORDER OF THE BATH.

C.B. (Military Division).

Col. (T. Brig.-Gen.) Ernest Reuben Charles Butler, C.M.G., F.R.C.V.S.

THE MOST DISTINGUISHED ORDER OF ST. MICHAEL AND ST. GEORGE.

C.M.G.

Lt.-Col. (T. Col.) Ernest Arthur Kendall, A.A.V.C.

For valuable services in connexion with the War (dated Jan. 1, 1918):—

ORDER OF ST. MICHAEL AND ST. GEORGE.

K.C.M.G.

Hon. Maj.-Gen. Fred Smith, C.B., C.M.G., F.R.C.V.S., ret. pay A.V.S.

C.M.G.

Col. (T. Brig.-Gen.) Charles Edwin Nuthall, C.B.

The King has been graciously pleased to approve of the following rewards for distinguished services in the Field (dated Jan. 1, 1918:—

TO BE HON. MAJOR-GENERAL.

Col. (T. Brig. Gen.) J. Moore, C.B., F.R.C.V.S.

TO BE BREVET COLONEL.

Col. (T. Col.) F. Eassie, C.M.G., D.S.O.

TO BE BREVET LT.-COLONEL.*

Maj. T. E. Burridge; Maj. (A. Lt.-Col). A. Oliver, C.M.G., F.R.C.V.S.

TO BE BREVET MAJOR.

T. Capt. (A. Maj.) S. L. Symonds.

For valuable services rendered in connexion with the War (dated Jan. 1, 1918:—

TO BE BREVET LT.-COL..

Maj. (T. Lt.-Col.) J. J. Aitken, D.S.O.

TO BE BREVET MAJOR.

Capt. (T. Maj.) A. S. Head, F.R.C.V.S., R. of O., late A.V.C.

War Office, Jan. 1st.

The King has been pleased to approve of the following rewards for distinguished Service in the field:—

DISTINGUISHED SERVICE ORDER.

Capt. (T. Maj.) Edward Cecil Doyle; Maj. Hugh Edward Gibbs; Capt. (T. Maj.) Adam Hodgins; Maj. William Kennedy, E. Afr. Vet. Corps; Capt. (T. Maj.) Victor Carmichael Leckie; Maj. William Ludgate; Maj. Reginald Cosway Matthews; Maj. John Scott Nimmo; Maj. Hugh Thomas Ryan; Maj. Leonard Morris Verney, F.R.C.V.S.; Maj. Herbert Mainwaring Williams.

AUSTRALIAN A.V.C.

Maj. Max Henry; Maj. Louis Evander McKenzie.

CANADIAN A.V.C.

Capt. (T. Lt.-Col.) David Sobey Tamblyn.

NEW ZEALAND A.V.C.

Maj. James Stafford.

Extracts from *London Gazette*,

WAR OFFICE, WHITEHALL, Jan. 1.

REGULAR FORCES. ARMY VETERINARY CORPS.

Maj. (actg. Lt.-Col.) J. J. Aitken, D.S.O., retains the actg. rank of Lt. Col. on alteration in posting (Jan. 2).

Temp. Capt. H. McC. Nedeau relinquishes his commn. on acct. of ill-health, and is granted the hon. rank of Capt. (Dec. 15, 1917).

The following casualties are reported:—

Previously reptd. Wounded, now reptd. Died of wounds—Capt. A. W. Campbell.

WOUNDED—Capt. J. M. Whyte, attd. R.G.A.

DIED—Lieut. H. H. Lefebvre.

OBITUARY.

HERBERT MAINWARING WILLIAMS, Major A.V.C., D.A.D.V.S. Graduated, Lond: Dec., 1904.

Major Williams died from wounds, on 23rd Dec., 1917, aged 38. He was the only son of the late Rev. R. Mainwaring Williams, Rector of Harnhill, Gloucestershire.

A. E. CLEASBY, M.R.C.V.S., Islebeck Grange, Tnirsk, Yorks. Edin: 1888.

Mr. Cleasby died on 20th Dec., 1917, aged 53.

E. IRELAND, M.R.C.V.S., Bridlington, Yorks. H. & A. S., 1872; Edin: April, 1880.

Death occurred on 27th Dec., 1917, at the age of 68.

R. A. W. STEVENSON, M.R.V.C.S., Brigg, Lincs. Lond: April, 1866.

Deceased 18th Dec., 1917, aged 71.

ARCHIBALD WRIGHT CAMPBELL, T. Capt. A.V.C., Wishaw, Lanark. Glas: June, 1916.

Members of the profession will learn with regret of the death of this promising young officer, who was the only son of Mr. Archibald Campbell, M.R.C.V.S., Wishaw.

Educated at Wishaw High School and Hamilton Academy, he joined the Army Veterinary Corps with a Lieutenant's commission immediately on obtaining his diploma. After six weeks' training at Aldershot, he sailed for Egypt as an officer in command of a veterinary section. Two months after he had landed in the East he was given the post of O.C. a mobile veterinary section, and for a year and five months was attached to the first line of defence in Salonica. There in January, 1917, he was promoted to the rank of Captain. Subsequently, at his own request, he was sent with the mobile section, in July, to Palestine, where he was posted to the Mounted Brigade, attached to headquarters, and latterly he was made a Brigade Officer. He sustained a gunshot wound in the head in action on the 28th November, and died in hospital on Dec. 13th.

Capt. Campbell had a distinguished college career, and was one of the most brilliant students who have graduated from the Glasgow Veterinary College. He gained seven medals and nine first-class certificates, and passed with honours his final examination for the diploma of the Royal College of Veterinary Surgeons.

DISEASES OF ANIMALS ACTS 1894 TO 1914, SUMMARY OF RETURNS.

Period.		Anthrax		Foot-and-Mouth Disease.		Glanders.†		Parasitic Mange. ‡		Sheep Scab.	Swine Fever.	
		Outbreaks (a)	Animals.	Outbreaks (a)	Animals.	Outbreaks (b)	Animals.	Outbreaks (b)	Animals.	(b)	Outbreaks (a)	Slaughtered. *
GT. BRITAIN. Week ended Dec. 29		4	6				7	119	218	22	23	5
Corresponding week in	1916 ...	13	21					41	80	36	49	26
	1915 ...	2	9					54	92	19	81	248
	1914 ...	12	21							8	58	199
Total for 52 weeks, 1917		421	480			24	62	2596	4831	543	2104	869
Corresponding period in	1916 ...	551	663	1	24	46	117	2104	4614	381	4288	9145
	1915 ...	575	641	56	702	49	85	933	1995	257	3994	16702
	1914 ...	722	796	27	166	97	286	1530	2642	226	4356	39277

‡ The Parasitic Mange Order of 1911 was suspended from 6th August, 1914, to 27th March, 1915, inclusive.
(a) Confirmed. (b) Reported by Local Authorities. † Counties affected, animals attacked:—Worcester 7
Board of Agriculture and Fisheries, Jan. 1, 1918 Excluding outbreaks in army horses.

IRELAND. Week ended Dec. 22	...	...	...	...	...	...	Outbreaks ...	15	1	5
Corresponding Week in 1916 ...	...	...	...	...	...	...	...	28	5	30
1915 ...	...	...	...	...	...	...	2	11	1	2
1914 ...	...	...	...	...	...	...	...	11	2	15
Total for 51 weeks, 1917 ...	3	5	...	...	1	1	45	422	198	1132
Corresponding period in 1916 ...	3	7	...	...	...	...	61	482	309	1847
1915 ...	2	2	...	...	1	3	70	409	244	1351
1914 ...	1	1	76	957	...	...	76	478	192	966

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, Dec. 24, 1917.
NOTE.—The figures for the Current Year are approximate only. * As diseased or Exposed to Infection